

# Characteristics of Radar Backscatter over Tropical Coastal Vegetation

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## Abstract

In this paper, we examine the characteristics of radar backscatter measurements at L-band and C-band frequencies over tropical coastal vegetation. We use two categories of coastal vegetation: mangrove marshes and forests, and analyze the radar frequency and polarization response to their structure and moisture conditions. Mangrove ecosystems are one of the most productive and complex wetlands on earth. Mangrove trees stand in the sea, on mud flats, which only dry out at low tides. Depending on the structure and type of the mangrove vegetation and the time of the data take, their radar signatures can vary and thus creating a nonunique scenario for their mapping and monitoring. As mangroves are threatened by deforestation and degradation which in turn contributes in the decline of clean water supplies, erosion, salinization of coastal soils, as well as the release of carbon dioxide in the atmosphere, development of a remote sensing technique for mapping and monitoring various types of mangroves have become vital. In this paper, we use a radar backscatter model to understand the general behavior of radar signatures over mangrove vegetation and to simulate various structure and moisture conditions. The results of the backscatter model and field observations of several mangrove ecosystems in Africa and South America, will be used to recommend a mapping and monitoring system.

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